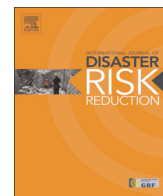




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# A conceptual model of a school–community collaborative network in enhancing coastal community resilience in Banda Aceh, Indonesia

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## ABSTRACT

Schools have an important role in knowledge development for building community resilience. It is important to involve the community with performing their roles to enhance resilience towards disaster, in order to ensure the sustainability of disaster education. This study aims to evaluate current efforts of disaster education and to develop a conceptual model for enhancing coastal community resilience. Qualitative and quantitative methodologies were used, including Focus Group Discussion and a questionnaire survey in 19 schools in Banda Aceh with a total of 634 respondents. The survey found that the school-based disaster preparedness (SSB) program was still effective in enhancing the resource mobilization capacity of teachers and students. But, in terms of obtaining knowledge from other sources, teachers in a SSB school have a lower percentage than teachers in a non-SSB school. This study also indicated some forms of collaboration that existed between school and community to improve school services. The results of this study proposed the School–Community Collaborative Networks (SCCN) model. The proposed model is expected to endorse the involvement of community in disaster education efforts and the use of a knowledge management strategy to provide individuals with a correct choice of action(s) to save lives. Also, the model hopefully can be used to promote transfer of knowledge from generation to generation as an important intangible asset to improve the sustainability, performance and innovation in resilience efforts.

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## 1. Introduction

The Hyogo Framework for Action (HFA) priority for action #3 highlighted the use of knowledge, innovation, and education to build a culture of safety and resilience at all levels [21]. In the 2006–2007, UN/ISDR initiated “Disaster Risk Reduction Begins at School” which emphasized the importance of integrating disaster risk reduction into formal education. It also highlighted the importance of community participation in order to achieve sustainability within the community [22]. This campaign has noted some learnt lessons which include the following: (i) education is a

process for effective disaster reduction; (ii) knowledge, perception, comprehension and actions are the four important steps; (iii) schools and formal education play significant roles in knowledge development; (iv) family-, community-, and self-education are essential for comprehension of knowledge and implementation of risk reduction actions; and (v) holistic education includes activities at local level, as well as its policy integration [15].

As an education institution, the school has the responsibility to deliver education and create a conducive learning atmosphere and process. Thus, in many developing countries, the school has a significant role in knowledge development for building community resilience in relation to the effort of managing disaster [12]. It is important to continuously provide disaster education in school [16]. The importance of disaster education at school is increasing because of the following reasons: (i) children are one of the most vulnerable groups during a disaster, (ii) children represent the

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future, (iii) school serves as a community's central location for meetings and group activities; and (iv) effects of education can be transferred to parents or family and community [12,15]. Pertaining to this, the school still gains trust as an effective institution to build the disaster resilience in societies, particularly among students, teachers, education practitioners, other stakeholders as well as to the public [12].

Disaster education should not be limited to the school, where education is provided, but should break the school boundary and be linked to the community and family. The role of family and community participation is crucial for the enhancement as well as the sustainability of disaster education [18]. In addition, to ensure the sustainability of the education, UNESCO has emphasized the importance of facilitating networking and collaboration among stakeholders [24]. Other involved stakeholders which exist within society, such as organizations, communities, agencies, departments, jurisdictions, and policy-making bodies, must recognize and perform their roles in a large cooperative effort for the development of disaster-resilient communities [18].

Shiwaku et al. pointed out that community plays an essential role in promoting students' actual actions for disaster risk reduction [14]. Shaw et al. carried out a comparative study of various modes of education on risk perception among school students in Japan. From the study, it was pointed out that community and family level of education have more direct influence on better disaster preparedness. The study also indicated that a school disaster risk reduction program, coupled with self, family and community education, can help a student develop a "culture of disaster preparedness" in their communities, and it was suggested that disaster education should involve non-formal activities that influence actions rather than mere knowledge [11].

Ronan et al. have examined correlates of hazards education involvement for youth. The study has two main findings: (i) younger children were generally seen to be more prepared and girls, more knowledgeable; and (ii) youth involved in education programs had significantly higher levels of correct knowledge of readiness and response behaviors, lower levels of incorrect knowledge, and reported more home-based hazards adjustments [27].

Using a quasi-experimental strategy, Ronan et al. also carried out a study to evaluate youth preparedness for disaster. The study found that following a brief school education program, supplementing a larger community-wide effort, children reported significant gains in preparedness indicators including increased knowledge as well as improvements in physical and psychosocial preparedness [11].

The objectives of this study are: (i) to evaluate current efforts of disaster education; (ii) to assess the current situation of school-community collaboration; (iii) to develop a conceptual model for school-community collaboration in enhancing coastal community resilience; and (iv) to develop a practical application of the model.

Findings from this study will suggest a proposed school-community collaborative networks model to enhance community resilience. The proposed model will need to be tested on different data set to confirm validity of the associations and refined in future studies.

The study took place in Banda Aceh, Aceh Province, Indonesia in the Indonesian Archipelago located at the meeting points of the earth's tectonic plates where the Eurasian plate directly collided with the Indo-Australian plate in the west and south sides. Another meeting point of three tectonic plates is in the east, namely the Philippine Sea plate, Pacific plate and Indo-Australian plate. Such a geographical location has made Indonesia prone to geological hazards such as earthquake, tsunami, landslide and volcanic eruption [4].

Aceh is a province in Indonesia that was the most affected

region of the December 26, 2004 Indian Ocean tsunami triggered by an earthquake measuring 9.15 on the Richter scale. Banda Aceh is the capital and the largest city in the Aceh province. During the 2004 tsunami, 61,065 people went missing and died, 21,751 housing units, 169 education facility units, 25 health center units and 302 km roads were all destroyed [2].

## 2. Methods

This study used both qualitative and quantitative methods. The qualitative methods involve a literature review and a group interview. The quantitative approach was with a survey questionnaire which was conducted to assess the level of preparedness for the school-based disaster preparedness (Sekolah Siaga Bencana/ SSB) and non-SSB schools.

A study using a cross-sectional design was carried out in 19 Public Junior High Schools in Banda Aceh in period July to August 2014. Among these schools there are five that have implemented the SSB program since 2012; they are SMPN 1, SMPN 5, SMPN 11, SMPN 12 and SMPN 15.

The map below (Fig. 1) provides information on the categories of the vulnerability to tsunami based on sub-districts where the schools are located.

Purposive sampling was carried out to select teachers and students from SSB and non-SSB schools. A total of 634 respondents were selected consisting of 243 teachers and 372 students.

To meet the objective of this research and inclusion criteria for students was that they be in the 9th grade, in the 14–16-year-old age range, and for teachers was had they had more than two years of working experience. These criteria were used in consideration of the fact that the students and teachers in SSB school had participated in the SSB program previously.

The questions used in the questionnaire were adopted from Lembaga Ilmu Pengetahuan Indonesia (LIPI)-UNESCO/International Strategy for Disaster Reduction (ISDR) [8]. The questionnaire consists of some aspects which are (i) knowledge of disaster, (ii) emergency planning, (iii) warning system, and (iv) resource mobilization capacity.

After the survey findings had been identified, the next step was to explore some theoretical concepts/models and related literature in order to create the framework of a network model between school and community. The conceptual framework was developed using the context in which collaborative efforts are best undertaken. In addition, the development of the conceptual framework is also referring to key findings from the survey in Banda Aceh and the literature review.

Fig. 2 below illustrates the flow of the development of the conceptual framework for school-community collaboration model.

## 3. The current status of schools

### 3.1. Evaluation of school-based disaster preparedness program

In 2006, the UN/ISDR secretariat in cooperation with UNESCO launched "Disaster Risk Reduction Begins at School", as a theme selected for the World Disaster Reduction Campaign 2006–2007. The campaign promotes two major initiatives: (i) making school buildings safer, and (ii) mainstreaming disaster risk reduction into school curricula. The campaign involves school children, teachers and non-academic staff and, in some cases, even surrounding communities [23]. Following this campaign, many activities have been carried out in all parts of the world, including the SSB program in Aceh, Indonesia.

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